WLCG Strategy Discussion

Financial sustainability of WLCG Services and Infrastructure

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Financial Challenges

- Flat-Cash: Globally HEP budgets are not expanding significantly and LHC computing is likely to continue to be operated in the flat-funding mode of the last decade.
- Increasing Costs: In several federations, this budget needs to cover some costs that are increasing over time (e.g. infrastructure and electricity).
- Economy and Technology: The hardware markets in the last five years have not been very favourable, which has limited the increase in the volume of resources that could be purchased year-on-year.

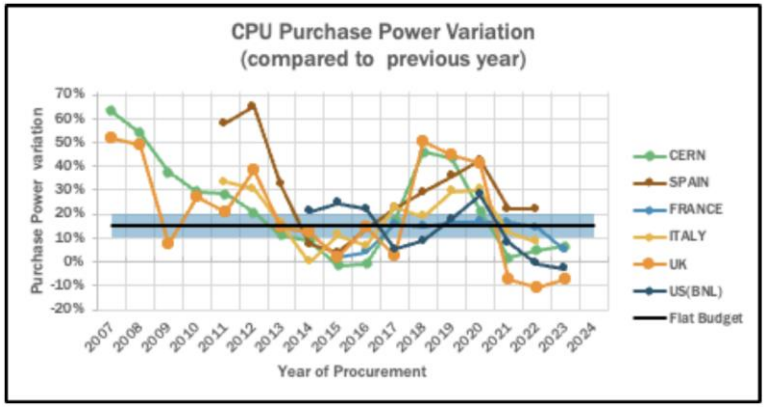
The WLCG Strategy document/discussion is an attempt to encapsulate what we can sensibly do to manage these challenges.

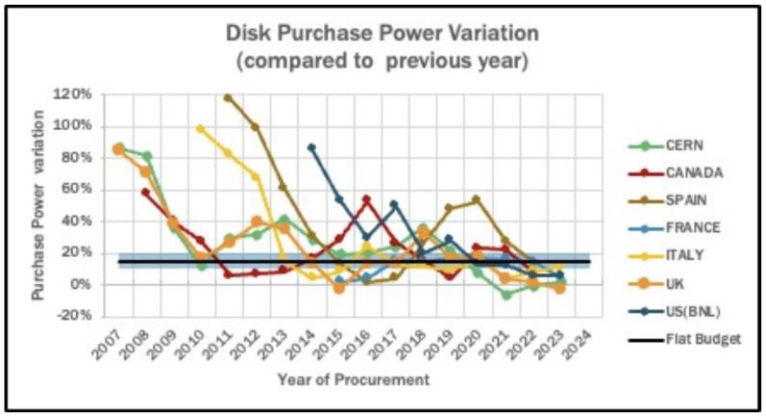
Draft Actions

- [FIN-1] WLCG to identify the appropriate structure to monitor hardware and market trends, globally and at national level.
- [FIN-2] WLCG to facilitate, harmonise and guide the development of a multi-year resource planning.
- [FIN-3] WLCG to monitor pledges against experiments authorship levels.
- [FIN-4] WLCG to enable finer-grain pledges with respect of current annually flat pledges, defining a model that can be validated by the experiments and efficiently serve their needs.
- [FIN-5] WLCG to identify a way to recognise the commitments (or list the contributions) of the Federations for middleware development and support.

FIN-1: Hardware and Market Trend Monitoring

- WLCG to identify the appropriate structure to monitor hardware and market trends, globally and at national level.





- WLCG has started to collect historical trend data at a national level.
- WLCG has also maintained a Technology Outlook (Bernd's talk on Monday).
- How do we do this in the future?
- Can we form an outlook of these trends (e.g. up to five years) to inform decisions about the areas of development in which the WLCG community should invest?
- Overlaps with:
  - Technical Coordination Board mandate?
  - Compute and Accelerator Forum?
  - HSF assumptions?
  - HEPIX technology-watch working group?

[FIN-2]: Multi-year resource planning

WLCG to facilitate, harmonise and guide the development of a multi-year resource planning.

- Some of the federations may be able to profile the budget for computing over many years.
- Can WLCG produce a multi-year (e.g., 5 and 10 years) outlook of the resource needs in addition to the current yearly estimates through the C-RSG process?
  - Agreed set of LHC parameter assumptions as per the LHCC Computing Review?
  - Could experiments work with a median development assumption, rather than Conservative/Aggressive?
  - What confidence level or error bars to assign (e.g. 10% per year of extrapolation)?
- These multi-year predictions should be accurate enough for the federations and their funding agencies to profile the future spending within a few tens of percent of uncertainty.

Current C-RSG process:

<table>
<tr><th colspan="2" rowspan="2">RRB Year</th><th colspan="5">Pledge Year</th></tr>
<tr><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th></tr>
<tr><td rowspan="2">2023</td><td>Spring</td><td rowspan="2">Pledges Used</td><td>Requirements Finalised</td><td></td><td></td><td></td></tr>
<tr><td>Autumn</td><td>Pledges Confirmed</td><td>Requirements Estimated</td><td></td><td></td></tr>
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Fin-3: Pledges and Authorship Levels

(WLCG to monitor pledges against experiments authorship levels).

- Greyed-out because this probably gets removed as a specific action in the strategy document. But…
- This information is all publicly available (experiment authorship fractions and federation pledges).
- WLCG should internally monitor this to inform itself on any discussions of pledge short-falls with the Overview Board, RRB, or CERN management, recognising that some federations may also contribute in other ways, such as providing services.
- We recognise that the experiments actively monitor this themselves and are the first line of action if something is out of balance.
- It is *not* WLCG's intention to publicly present this information.

Fin-4: Fine Grain Pledges

WLCG to enable finer-grain pledges with respect of current annually flat pledges, defining a model that can be validated by the experiments and efficiently serve their needs.

- In fact, the ability to enter quarterly pledges was requested and implemented a long time ago but has never been used. Recently this has been 'hidden' because it caused some confusion, but the ability already exists behind the scenes.
- The idea is that, in the future, some resources could be *'time limited allocations'* (such as HPC allocations or cloud contracts). If these were substantial, they would clearly need to be agreed, in advance, between the Federation and the relevant Experiment.
- WLCG should ensure that it can accommodate such 'bursty' pledges, without introducing unnecessary complexity or confusion into the normal pledge process.

Fin-5: Other Federation Commitments

WLCG to identify a way to recognise the commitments (or list the contributions) of the Federations for middleware development and support.

- In addition to pledges, some federations make other substantial contributions through the development and/or support of federal services used by the global community such as APEL, dCache, GGUS, GOCDB, IAM, Security, etc.
- These contributions represent both a benefit, and potential risk (through dependency), to WLCG. Both the benefit and risk should be recognised.
  - Recognition may help partners secure future funding.
  - Risk management will reduce the potential operational impact of problems.
- Ultimately, the commitments could be made more formal, e.g. through an MoU or a Collaboration Agreement.